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ABSTRACT

The implementation of a comprehensive reform model for early childhood programs, Curiosity Corner, developed by the Success For All Foundation at the request of the New Jersey Department of Education, is evaluated in this study. The program was implemented in 27 child care and preschool classes in 4 high poverty urban areas and outcomes were compared to those of 23 matched control classes. In observations of classroom environment quality using the Early Childhood Environment Rating Scale, Curiosity Corner classes received higher ratings than controls. The language abilities, as measured by the Mullen Scales of Early Learning, of 316 three- and four-year-olds who participated for 1 year in either an experimental or control class were also compared. The expressive language abilities of children in Curiosity Corner classes for 3-year-olds were significantly higher than those of children in control classes. There were no differences in children's receptive language or visual reception. Children in classes with higher quality ratings showed better performance on the expressive language subscale. (Contains 16 references.) (Author/EV)

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Curiosity Corner: Enhancing Preschoolers' Language Abilities Through Comprehensive Reform

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Abstract

This study reports on the implementation and evaluation of Curiosity Corner, a comprehensive preschool program. The program was implemented in 27 child-care and preschool classes in four high poverty urban areas, and compared to 23 matched control classes. In observations of classroom environment quality using the Early Childhood Environment Rating Scale, Curiosity Corner classes received higher ratings. The language abilities, as measured by the Mullen Scales of Early Learning, of 316 three- and four-year-old children who participated for one year in either experimental or control classes were also compared. The expressive language abilities of children in the three-year-old Curiosity Corner classes were significantly higher than those of children in control classes. There were no differences on children's receptive language or visual reception. Children in classes with higher quality ratings showed better performance on the expressive language subscale.

Curiosity Corner: Enhancing Preschoolers' Language Abilities

Through Comprehensive Reform

The education of young children in high-poverty areas is at a crossroads. Public understanding of the importance of quality early childhood education has grown, due in part to the widely reported longitudinal evaluations of the Perry Preschool (Barnett, 1995), the Abecedarian Project (Campbell & Ramey, 1995), and other programs, and to research on the impact of the environment on the developing brains of young children. This has led to calls for greatly expanded and improved early childhood programs from policy makers across the political spectrum.

Yet at the same time as support for expansion of early childhood programs is growing, the supply of qualified teachers for these programs is shrinking. A serious teacher shortage in elementary and secondary schools has drawn qualified teachers to those settings, rather than to early childhood. Low pay, low status, and inadequate opportunities for professional development have contributed to high turnover among early childhood educators. All of these trends exist across the board, but the situation for institutions serving disadvantaged and minority children is far worse than in middle class communities.

If the expansion of early childhood programs is to achieve the impact hoped for by educators, policy makers, and the public, these programs must be of the highest quality. Clearly, programs of professional development capable of ensuring teaching success for a broad range of educators must be a central focus of reform. Even the best qualified, most experienced early childhood teachers need continuing high-quality professional development, research-based materials, and other supports, but the many new educators entering early childhood programs in

the current period of expansion are particularly in need of well-structured, well-researched, and complete models.

In the movement to reform America's schools, a new approach has come to the fore. Comprehensive reform models for elementary and secondary schools are increasingly being adopted, especially by high-poverty schools. These programs incorporate all core aspects of a school's functioning: curriculum, instruction, assessment, professional development, parent involvement, provisions for children experiencing difficulties, and so on. Research on many of these models, especially those providing greater structure, extensive materials, and ongoing professional development, has found positive effects on student achievement in many studies (see Herman, 1999). Comprehensive reforms of this kind would appear to have particular promise for early childhood education, where the need for systematic professional development on a broad scale seems greatest. Programs such as High/Scope and the Creative Curriculum do provide training and materials to help early childhood educators use effective practices. What comprehensive programs add to this is far greater specificity, extensive materials, and thorough, ongoing professional development, follow-up coaching, and assessment.

The present paper reports the results of the first evaluation of a comprehensive reform model applied to early childhood. This model, Curiosity Corner, was developed by the organization that developed and researched Success for All, the most extensively evaluated and widely used of all comprehensive reform models in elementary schools. Curiosity Corner borrows from Success for All a focus on extensive professional development, well-specified materials and strategies, parent involvement, and other aspects, but otherwise it is quite different. It is designed in accordance with research on the developmental needs of three- and four-year-olds, which are of course quite different from those of elementary-aged children.

Curiosity Corner was developed in response to a particular opportunity, the requirement by the New Jersey Supreme Court, in the landmark Abbott v. Burke funding equity case, that every three- and four-year-old in New Jersey's thirty highest-poverty urban districts be given access to a quality preschool. This rapid expansion of an entitlement to preschool created a demand for hundreds of new teachers, and the New Jersey Department of Education (NJDOE) wanted to ensure that the many programs funded under Abbott would be able to implement high-quality programs that would accomplish the court's goals. To this end, the NJDOE asked the Success for All Foundation to design, evaluate, and disseminate a comprehensive reform model for early childhood programs. The Curiosity Corner program, designed in response to the Abbott challenge, was first piloted in the 1999-2000 school year.

Children in the Abbott districts are typically 18 months behind in their oral language development by the time they begin kindergarten (Barnett, Tarr, & Frede, 1999). Low socioeconomic status, particularly when combined with immigrant status or minority status, is negatively correlated with children's school achievement and socialization (Huffman, Mehlinger, & Kerivan, 2000; West, Denton, & Reaney, 2000). However, preschool experiences can improve children's chances of succeeding in school and in life. Researchers have reported short- and long-term positive effects of preschool on cognitive and social factors (Barnett, 1995; Karoly et al., 1998; Zaslow, Oldham, Moore, & Magenheim, 1998). This paper presents the evaluation and results of this first attempt to create a comprehensive reform model for early childhood education.

Curiosity Corner

Curiosity Corner is based on research on child development and early childhood programs designed for children at risk of school failure due to poverty (Barnett, 1995; Bowman,

Donovan, & Burns, 2001); the National Association for the Education of Young Children guidelines (Bredekamp, 1997); state standards; and the Success for All Foundation's experience developing research-based educational programs (Slavin & Madden, 2001). This detailed program is designed to provide three and four year olds with experiences that develop the attitudes, skills, and knowledge needed for future success in school.

Curiosity Corner was designed to promote the development of the whole child, including the emotional/personal, interpersonal, language and literacy, cognitive, mathematical, science, creative, physical, and social studies domains. Curiosity Corner can be implemented in a variety of early childhood settings (e.g., childcare centers, prekindergarten classes, Head Start centers) with educators who possess a broad range of teacher preparation (i.e., minimal through masters level training). It provides educators with detailed instructions and many of the materials needed to implement a stimulating program, as well as training and follow-up support.

The Curiosity Corner Curriculum. Curiosity Corner is an integrated curriculum with specific weekly thematic units that feature concrete, active experiences built on a daily sequence of components: Greetings & Readings, Clues & Questions, Rhyme Time, Learning Labs, Story Tree, Outside/Gross Motor Play, Snack Time, and Question/Reflection. Families are encouraged to become actively engaged in their children's learning through home visits, the weekly Home Link Page, a lending library, story reading videos, and participation in classroom activities. One of the key features of Curiosity Corner is its focus on language and literacy. This focus assumes that the promotion of emergent oral language and literacy are key factors in later academic achievement (Huffman, Mehlinger, & Kerivan, 2000). Literacy environments that contain book and print awareness and opportunities for writing promote children's emergent literacy

(Bowman, Donovan, & Burns, 2001). Emergent literacy is important because it provides a foundation for children to learn to read, which is the cornerstone of school success.

Staffing, Support, and Materials. Adequate staff-child ratios are necessary to ensure that children receive the attention that they need to reach their full potential. Each class of 15 children is required to have one trained early childhood educator and one assistant. If there are children who require special care or supervision, the classes have additional assistance, such as teachers or assistants.

A comprehensive reform program as complex as Curiosity Corner requires considerable support and training. All staff members, including teachers, assistants, and administrators, receive two days of initial training and then six follow-up in-class visits and workshops by a Success for All Foundation trainer. The workshops are tailored to the needs of particular groups of teachers and include topics such as reading books to a group of children. Neuman (1996) found this type of intervention doubled literacy interactions in classrooms and improved children's performance on a host of literacy factors, compared to that of children whose teachers did not receive such training.

School districts are required to support the implementation of the program with a Curiosity Corner Coach for every twelve preschool classes. The Curiosity Corner Coaches help teachers prepare materials for the program, observe, and mentor the teachers. They offer workshops on issues that arise in implementing the program, organize sessions offered by the Curiosity Corner trainers, and coordinate observation visits by the trainers. They keep abreast of developments in the program, and coordinate with the schools/centers, districts, and the Success for All Foundation staff.

Curiosity Corner comes with a teacher's manual, thirty-eight weekly theme guides, over 150 children's trade books, manipulatives, games, and other materials to supplement the basic supplies of a regular early childhood classroom.

Implementation

Several challenges faced districts attempting to comply with the Abbott directive to implement universal preschool for three and four year olds. First, there were not enough certified early childhood educators to teach these classes. Second, many districts did not have enough space in their schools to house these additional children, especially space designed to meet the needs of very young children. Third, the New Jersey Department of Education held school districts accountable for the preschool classes but encouraged them to collaborate with community-based agencies, such as child care centers and Head Start centers, to implement the classes. Thus, preschool classes were implemented in a variety of settings. Classes in this study were implemented in elementary schools, in early childhood centers run by school districts, in Head Start centers, child-care centers, and other community preschool programs.

We predicted that Curiosity Corner classes would be higher quality environments than control classes, and that at posttest, the language abilities of children in Curiosity Corner classes would exceed those of children in the control classes.

Method

This study combined observations and testing to evaluate the Curiosity Corner program, assess the language abilities of children in Curiosity Corner preschool classes, and compare these classes to matched control classes. Children's language abilities in Curiosity Corner preschools were compared with those of children in control preschools and with national norms.

Participants

Subjects of this study were 169 three-year-old children attending privately run early childhood centers and 147 four-year-olds attending publicly run preschool classrooms (age range: 2 years, 7 months to 4 years, 11 months at initial testing). Children attended 27 Curiosity Corner and 23 control preschool classrooms. Classrooms were in four New Jersey urban, high-poverty school districts. The total sample of 316 children was 67.9% African American, 15.6% White, and 10.9% Hispanic; 48.7% female and 51.3% male. Control sites in similar settings (school, center) were selected to match the Curiosity Corner sites based on demographic characteristics.

Measures

Early Childhood Environmental Rating Scale. The quality of the early childhood classroom environments was assessed using the Early Childhood Environmental Rating Scale-Revised (ECERS-R). This is an observation measure of program quality that includes the following subscales: Language-Reasoning, Interaction (among children and between children and teachers), and Program Structure. Test-retest reliability for the ECERS was 86.1 % agreement across the full set of 470 indicators. Each classroom is observed over a period of 3 to 5 hours, and rated on each item according to the observer's answers on a series of questions related to specific attributes of classroom environment. Items were rated 1-7, where 7 is excellent, 5 is good, 3 is minimal, and 1 is inadequate. The ECERS-R yields a score between 1 and 7 for the full scale, which is the mean of ratings on 34 items. The subscales also yield a mean of related items between 1-7. The Language subscale and two items of the Interaction subscale (Child/Child Interaction and Staff/Child Interaction) were analyzed individually because of the correlation between improved language environments and success in school

Peabody Picture Vocabulary Test. The Peabody Picture Vocabulary Test (PPVT-III) was administered as a pretest to establish a baseline. The PPVT-III is a norm-referenced, standardized measure of receptive vocabulary (Dunn & Dunn, 1997). Test-retest reliability coefficients for the PPVT-III, as administered to four age groups, ranged from 0.91 to 0.94.

Mullen Scales of Early Learning. The posttest was three scales from the Mullen Scales of Early Learning – American Guidance Services Edition (MSEL): Expressive Language (EL), Receptive Language (RL), and Visual Reception (VR). The MSEL is an individually-administered, standardized, developmental test for children aged 15 to 68 months. The EL scale measures abilities such as speaking and language formation (the ability to verbalize concepts) that contribute to a child's ability to use language. The RL scale tests abilities including auditory organization, sequencing, and use of spatial concepts that relate to a child's ability to process linguistic input. The VR scale measures the processing of visual patterns by examining skills related to visual discrimination and visual memory (Mullen, 1995). Test-retest reliabilities for the MSEL, administered to children aged 25 to 56 months, were 0.71, 0.77, and 0.75 for the expressive language, receptive language, and visual reception scales, respectively.

Procedure

Testers trained by SFAF researchers administered the PPVT-III over a period of four weeks during October 1999. Testing sessions required, on average, ten minutes per child.

The following spring, between May 1 and June 10, 2000, testers administered the three MSEL subscales. Interrater reliabilities for testers on this instrument were +.54, +.80, and +.68 for the expressive language, receptive language, and visual reception scales, respectively. All of these coefficients are significant at the $p. < 0.01$ level.

The ECERS-R was administered during the same timeframe as the MSEL. As some teachers taught both morning and afternoon classes in the same classroom, observations for only one class per teacher were analyzed, 19 Curiosity Corner and 13 control classes. Four observers included two researchers from SFAF and two observers trained by these researchers. Arrangements were made with each site for observation dates and times. This ensured that administrators and teachers were receptive to being observed. Each observation took between three and five hours, enough time so that all of the day's activities could be seen. Interrater reliability among observers was +.70.

Design and Analyses

A 2x2x2x4 ANOVA was conducted on the PPVT-III pretest scores. It indicated no main or interaction effects associated with treatment, gender (male, female), ESL status (yes, no), or ethnicity (African-American, European American, Hispanic, Other). There was a main effect of age group (3, 4) on PPVT-III scores, $F(1, 315) = 5.58$, $p < 0.02$, but no interaction (see Table 1 for means and standard deviations). Thus, this baseline measure indicated that the matched groups were similar in their pretreatment receptive language skills. While there were no main or interaction effects of condition, the direction of the difference in PPVT-III scores across conditions favored the experimental group. Age and PPVT-III scores were used as covariates in subsequent analyses.

This quasi-experimental study employed a series of ANCOVAs, with condition as the independent variable, MSEL language scores as the dependent measures, and the PPVT-III pretest scores and age at testing as covariates.

Results

Classroom-Level Analyses

Early Childhood Environmental Rating Scale. The mean ECERS score for the sample of 32 classrooms observed was 4.59, which is above the scale's midpoint (3.5). Table 2 displays the mean ECERS scale scores by condition. An analysis of variance with condition and observer as factors indicated a main effect of observer on ECERS scores; thus subsequent analyses included observer as a covariate.

Univariate analyses of covariance with observer as a covariate indicated a main effect of condition on ECERS scores. Curiosity Corner classrooms were rated significantly higher than controls, $F(1, 31) = 12.93$, $p < .001$, with an effect size of +1.28. The mean of classroom ratings on the Language subscale rating for Curiosity Corner was also significantly greater than that for control classrooms, $F(1, 31) = 17.30$, $p < .001$. The effect size was +1.49. The mean rating of Child/Child Interaction for Curiosity Corner classrooms was significantly greater than that for control classrooms, $F(1, 31) = 9.13$, $p = .005$. The effect size was +1.03. The mean rating of Staff/Child interaction for Curiosity Corner classrooms predominantly favored Curiosity Corner but was not significantly different than that for control classrooms, $F(1,31) = 2.27$, n.s., ES = +0.70.

Student-Level Analyses

Mullen Scales of Early Learning (MSEL). A series of ANCOVAs were conducted to examine the effects of condition on the MSEL language scales. Scores on the PPVT-III pretest and children's age were entered as covariates.

Performance on the Expressive Language (EL), Receptive Language (RL), and Visual Reception (VR) scales of the MSEL were examined in three stages. Analyses were first

completed across age groups, combining three year olds at private childcare centers (threes in centers) and four year olds at public schools (fours in schools). Next, analyses of threes in centers and fours in schools were computed separately.

Expressive Language. Table 3 displays students' scores on the EL scale, disaggregated by age and experimental condition. Mean scores were similar across gender and ethnic groups. Analyses were completed to separately examine the performance of three year olds who attended Curiosity Corner or control classrooms located in centers. An ANCOVA, with age and PPVT-III as covariates, indicated that the difference between EL means for Curiosity Corner students and controls was significant, F (1,166) = 6.03, p = .015, with an effect size of +0.40. The observed difference between the treatment groups for the three year olds was not evident among the four-year-olds, F (1,145) < 1.00, n.s. As before, gender and ethnic groups performed similarly.

Receptive Language and Visual Reception. Refer again to Table 3 for children's mean scores on the Receptive Language (RL) and Visual Reception (VR) scales of the MSEL. Scores were similar across gender, ethnic, and treatment groups. ANCOVAs parallel to those computed for EL indicated no difference between treatment groups on the RL, F (1, 314) = 1.11, n.s., or VR, F (1, 310) = 1.00, n.s. There were no significant differences among three year olds in RL, F (1, 167) < 1.00, n.s. or VR, F (1, 164) <1.00, n.s. Nor were there significant differences across treatment groups among four-year-olds on RL, F (1, 146) < 1.00, n.s. or VR, F (1, 145) < 1.00, n.s.

Correlation Between Quality and Language Abilities

Partial correlation coefficients were computed to examine the relationships between performance outcomes and classroom environment variables. Means for the three scales of the MSEL were computed for each classroom and compared with ECERS ratings for that classroom.

Because there was a main effect of observer on ECERS scores, observer effects were partialed out of correlation analyses. Analyses were two tailed. Classroom ratings on the Language subscale of the ECERS were significantly correlated ($r = +.39$, $p < .025$) with performance on the Expressive Language scale of the MSEL.

Discussion

The evaluation of Curiosity Corner, a new comprehensive preschool program, focused on the quality of environment provided by the program, and children's language abilities following participation in the program. Results indicate that Curiosity Corner sites were rated significantly higher than control sites on the ECERS-R, and more effectively promoted children's Language, Reasoning, and Child/Child interactions. The three-year-old Curiosity Corner classrooms also promoted more Staff/Child interaction than control classrooms. The goals of the Curiosity Corner program, insofar as language, literacy, and children's interaction are stressed, were reflected in observations made using the ECERS-R.

Children in three-year-old Curiosity Corner classrooms had significantly higher expressive language abilities than children in control classes. There were no significant differences between experimental and control subjects on either the receptive language or visual reception scales. The findings for expressive language are in keeping with the Curiosity Corner program's emphasis on oral language development. At the same time, the apparent lack of program effect on receptive language and visual reception may also be a function of the control sites' focus. Control settings tended to employ more traditional teaching strategies, in which teachers direct and children follow directions. For this reason it is not surprising that these children scored at a similar level as Curiosity Corner children in receptive language.

The positive correlation of children's performance on the Expressive Language scale of the MSEL with classroom ratings on the Language-Reasoning subscale of the ECERS-R supports the intuitive association between language and literacy rich preschool environments and children's language abilities. This relationship is only correlational; however, taken together with the classroom observation and performance findings, this work does suggest that the relationship between treatment and outcomes in this study may be substantially due to the literacy readiness emphasis of Curiosity Corner. Further study of particular aspects of preschool programs is needed to determine causation, and to enable educators to maximize the conditions under which children's learning is most positively affected.

Limitations

There were two major limitations to this study. The study began with questions regarding impact of site type and teacher qualifications on children's achievement. The first limitation is that it was not possible to include a comparison of children's achievement according to site type for both ages, three and four. The two distinctive site types were schools settings and community childcare centers. Due to space constraints in schools and the New Jersey State Department of Education policy of promoting collaboration between school districts and community centers, the four year olds were concentrated in school settings, while three year olds generally attended child care centers. Age was completely confounded with site types. Thus, it was not possible to discern whether the programs work equally well in school and center settings.

The second limitation resulted from the inclusion of preschool programs in elementary schools. Teachers in this setting had more formal qualifications than did their peers in child-care

settings. Therefore, site type confounded any attempt to examine the relationship between achievement and teacher qualifications.

Implications for Future Research

Since this study examined only the first (pilot) year of Curiosity Corner implementation, a further longitudinal analysis is needed to answer questions of program quality. Plans are in place to continue research on the program, and to follow children into kindergarten and beyond, in order to assess the full impact of participating in this comprehensive preschool program.

The research on the connection between early childhood education and school achievement holds promise (Barnett, 1995; Huffman, Mehlinger, & Kerivan, 2000). Weikart (1998) claims that every dollar invested in preschool education saves more than seven dollars to society for future remediation and social programs. However, due to small samples and questionable research designs in most studies of alternative designs for early childhood education, it is still unclear what characteristics of early childhood education lead to improved outcomes for disadvantaged children (Frede, 1995). Bowman, Donovan, and Burns (2001) call for rigorous research on the characteristics of programs that are effective for children at risk for educational failure.

Implications for Policy and Practice

Despite the limitations of this study, it contains relevant information for both policy and practice. In terms of policy, the potential exists for universal preschool education to improve the oral language development of children from high poverty districts, thereby augmenting their chance for continued academic success. How this potential can be realized on a broad scale remains to be seen. With a shortage of certified teachers, it will likely take comprehensive, detailed programs that provide considerable professional development and continual support to

achieve that goal. In practice, early childhood educators must focus their efforts on fostering the language development of disadvantaged children to improve their chances of future school success.

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Table 1

PPVT-III (Pretest) Scores as a Function of Condition and Gender

		Curiosity	Control	Total
Total	M	39.10	36.65	38.25
	N	206	110	316
	SD	18.07	17.14	17.76
Female	M	40.72	37.88	39.61
	N	92	59	151
	SD	18.72	17.51	18.25
Male	M	37.79	35.24	37.00
	N	114	51	165
	SD	17.51	16.75	17.27

Table 2

Early Childhood Environment Rating Scale and Three Subscale Ratings

		Curiosity	Control
Scale Average	M	5.22	3.58
	N	19	13
	SD	1.06	1.28
Language/Reasoning Subscale	M	5.89	3.31
	N	19	13
	SD	1.50	1.73
Child/Child Interaction	M	6.26	3.70
	N	19	13
	SD	1.59	2.49
Staff/Child Interaction	M	5.63	4.00
	N	19	13
	SD	2.43	2.31

Table 3

Mullen Scales of Early Learning Adjusted Scores for Three Scales

			Threes Private Centers	Fours Public Schools
Expressive Language	Curiosity	M	39.26	43.58
		N	104	99
		SD	5.04	4.55
	Control	M	37.54	43.29
		N	63	47
		SD	4.30	4.01
Receptive Language	Curiosity	M	37.76	43.1
		N	106	100
		SD	4.40	4.32
	Control	M	37.52	42.85
		N	62	47
		SD	4.68	3.78
Visual Reception	Curiosity	M	42.32	45.49
		N	103	99
		SD	3.54	3.20
	Control	M	42.66	45.61
		N	62	146
		SD	4.04	3.20